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Chapter 1 - Background

General Description of the Application

Project description

On November 10, 1999, Wisconsin Public Service Corporation (WPSC) and Minnesota Power (MP) jointly filed an application with the Public Service Commission of Wisconsin (Commission or PSCW) for authority under Wis. Stat. §§ 196.49 and 196.491, and Wis. Admin. Code chs. PSC 111 and PSC 112, to construct new transmission facilities. The applicants are seeking the Commission's approval of this project, and the issuance of a Certificate of Public Convenience and Necessity (CPCN). The primary purpose of the proposed project is to install a high capacity, 345,000-volt (345 kilovolt (kV)) transmission circuit to connect MP's Arrowhead Substation, west of Duluth, Minnesota, with WPSC's Weston Substation just south of Wausau, Wisconsin. The new 345 kV line would be approximately 225 miles in length, depending on the exact route chosen. A secondary component of the project is an approximately 42-mile long, 115,000-volt (115 kV) transmission line from Tripoli, Wisconsin, to the Highway 8 Substation in Rhinelander, Wisconsin. The 115 kV line would be connected to the 345 kV line at a new substation near the village of Tripoli.

The Arrowhead-Weston Transmission Project, including both the 345 kV and the 115 kV transmission line, is the subject of this Environmental Impact Statement (EIS). The Commission will make its decisions on this proposal under docket 05-CE-113. The applicants state that the project is needed to strengthen the bulk transmission system by providing a second high capacity connection across the Wisconsin–Minnesota transmission interface. They further state that a 115 kV connection between the 345 kV line and Rhinelander will provide more reliable local load serving capability for the Rhinelander area.

The proposal would require construction of transmission lines, substations, and associated facilities, as described below.

Arrowhead-Weston 345 kV line

The 345 kV line would consist of two-conductor bundles for each of the three phases, for a total of six wires. The line will also include two shield wires mounted above the conductors to provide lightning protection for the line. Shield wires would be grounded at each structure with

at least one 24-foot copper ground rod per structure. The number of ground rods would vary depending on the type and resistance of the soil. The 345 kV circuit would be a grounded Y system, without a neutral, that would be grounded at each transformer.

Route options for the 345 kV line include a double circuit configuration with existing transmission line, single circuit configurations parallel to existing transmission line, railroad right-of ways (ROW), pipelines and other existing corridors, and single circuit configurations where corridor sharing is not possible.

Either steel H-frame structures (Figure Vol. 2-1) or single pole davit arm structures would be used where the new line is standing alone or running parallel to an existing line. H-frame structures would be direct buried and between 85 to 95 feet in height, while the single pole single circuit davit arm structures would require cement foundations and would have an average height of 90 to 105 feet.

Some existing transmission lines could be double circuited with the proposed line; they have operating voltages of 46 kV, 69 kV, 115 kV, 161 kV and 345 kV. A single pole, double circuit davit arm structure, like that shown in Figure Vol. 2-2, would be used if the new line is double circuited with an existing line. These structures would have an average height of 125 to 135 feet and would be constructed of weathering steel. Steel lattice towers (Figure Vol. 2-3) would be used at corners and at substantial changes in alignment. In all cases, the proposed span distance between structures averages between 800 and 1,000 feet.

If approved, the 345 kV line would use a fiber optic system to communicate with and control substation equipment. The fiber optic wire would be incorporated in a 48-fiber optical ground wire. The fiber optic system would require construction of four regeneration stations, one every 50 to 60 miles, and a terminal station at the Weston Substation. Each regeneration station would be housed in a 16x26 foot metal building within an enclosed yard and would require 120-volt electrical service, plus a driveway with access to a maintained roadway. The regeneration stations would be located next to an existing substation or within the power line ROW. The total cost for the four regeneration stations and the terminal station is estimated at approximately $760,000. Additional information regarding the applicants' proposal to use a fiber optic ground wire system is provided in Chapter 6.

Tripoli to Rhinelander 115 kV line

The 115 kV line would be constructed with three conductors on single pole davit arm structures (Figure Vol. 2-4), with an average span length of 600 to 800 feet. This pole design would be used where the line is standing alone or built parallel to another transmission line. Where the line could be double circuited with an existing 115 kV line, a single pole double circuit structure (Figure Vol. 2-5) of weathering steel would be used. The single circuit structures may be somewhat shorter than the double circuit structures; single circuit structures average 70 to 100 feet while double circuit structures average from 85 to 100 feet in height.

Substations

IThe proposed project includes construction of a new 345/115 kV substation at the Weston Power Plant. The new Weston Substation would include a new 300 megavolt amperes (MVA), 345/115 kV transformer, a 345 kV ring bus, and associated equipment. The existing Rocky Run 345 kV transmission line and the proposed Arrowhead 345 kV line would be connected (looped) to the ring bus at the Weston Substation. The 115 kV side of the proposed 345/115 kV transformer at Weston Substation would tie into the existing switchyard and associated 115 kV facilities at the Weston Power Plant.

If the 345 kV line is approved and a route that generally follows the Exeland-Tripoli-Weston corridor is approved, WPSC proposes to construct a new 345/115 kV Tripoli Substation at one of four proposed sites near the village of Tripoli. The routes for the proposed 345 kV and associated 115 kV transmission lines would determine the final location of the proposed Tripoli Substation. The Tripoli Substation and associated equipment would be similar to the proposed Weston Substation.

Some changes to the Highway 8 and Hodag Substations at Rhinelander would also be required. At the Highway 8 Substation in Rhinelander, a new 115 kV terminal with breaker and disconnect switches would be added. To make room for the new terminal, existing capacitor banks would be moved from the Highway 8 Substation to the Hodag Substation.

Estimated costs for the proposed substation work are approximately $4 million for each of the 345/115 kV substations (one at Weston and another near Tripoli). Modifications at the existing Highway 8 Substation in Rhinelander would cost approximately $200,000.

If a route that follows the Exeland-Owen-Weston corridor is approved for the 345 kV line, WPSC would likely consider other options for providing additional electrical support to the Rhinelander area. (See Chapter 10.)

Route sectors and line segments

This project is broken into four route sectors; three cover the project area for the proposed 345 kV line and the fourth covers the project area for the 115 kV line. (See Figures 6-1 through 6-4.) The applicants have divided each route alternative into short segments and have numbered the segments for identification purposes.

- The Oliver Sector extends from the Wisconsin-Minnesota border at Oliver to Exeland (near Ladysmith); route segments in this sector are numbered in the 300s.
- The Tripoli Sector extends from Exeland to Weston by way of Tripoli; route segments in this sector are numbered in the 100s.
- The Owen Sector extends from Exeland to Weston by way of Owen–Withee; route segments in this sector are numbered in the 200s.

- The Rhinelander Sector extends from the proposed Tripoli Substation to the Highway 8 Substation near Rhinelander; route segments in this sector are numbered in the 400s.

Ownership and the operation of the project

WPSC is responsible for the costs of construction[2] and shall own[3] the portion of the 345 kV transmission line located in Wisconsin. MP would construct and own the portion of the 345 kV transmission line located in Minnesota. However, MP retains an option to purchase the portion of the transmission line from Ladysmith, Wisconsin to Minnesota from WPSC at the recorded book cost. MP must inform WPSC of its intent to exercise its purchase option prior to the transmission line becoming operational. If MP exercises its option, WPSC and MP must obtain Commission approval for the transfer of ownership.

WPSC would also construct and own the 115 kV line from the Tripoli Substation to Rhinelander. However, WPSC now expects to divest its transmission facilities to the new transmission company American Transmission Company, LLC, (ATCo) that is forming in response to recent changes in state law. As a consequence, all parts of this project owned by WPSC would most likely be turned over to the transmission company. The organization and operation of the ATCo is described in more detail in the last section of Chapter 2.

WPSC is an electric public utility as defined in Wis. Stat. § 196.01, engaged in the generation, transmission, distribution, and sale of electric energy to approximately 400,000 customers in the northeastern and north central parts of Wisconsin and adjacent parts of the Upper Peninsula of Michigan. WPSC owns and operates an extensive network of electric generating stations, transmission lines, and substations in its service area. WPSC's transmission system consists primarily of 69, 115, 138, and 345 kV lines. It has direct connections with Northern States Power Company NSP), Wisconsin Power and Light Company (WP&L), and Wisconsin Electric Power Company (WEPCO).

MP is a public utility corporation organized under Minnesota laws with its principal office in Duluth, Minnesota. MP provides electric energy to customers in the north and central parts of Minnesota. Superior Water, Light and Power (SWL&P), a wholly owned affiliate of MP, provides electric energy, water, and natural gas service to customers in parts of northwest Wisconsin.

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[2] MP would be responsible for the construction of the portion of the project in Minnesota, as well as that portion of the project from Ladysmith to the Minnesota border in Wisconsin. WPSC will reimburse MP for all reasonable costs related to the construction of the project in Wisconsin, without regard to whether the project receives regulatory approval, is actually constructed, or goes into service.

[3] All or portions of the proposed 345 kV transmission line in Wisconsin, and all of the proposed 115 kV transmission line, and associated substations could be transferred to the American Transmission Company, LLC (ATCo) upon completion of the project. Chapter 2 provides additional information about ATCo.

Cost

The total cost of the Arrowhead-Weston Transmission Project, including 12 miles in Minnesota, is estimated to range from $153.55 million to $208.23 million depending on the route chosen and conditions encountered along that route. The lower cost estimate includes building a new 345 kV/115 kV substation at Weston and 224 to 249 miles of 345 kV transmission line. The higher cost estimate includes, in addition to the above, a new 345 kV/115 kV substation near Tripoli and modifications to the Highway 8 and Hodag Substations. Table 1-1 gives a breakdown of the high and low estimates, including the 5 percent environmental impact fee required by 1999 Wisconsin Act 9 for all new 345 kV transmission lines. The costs discussed here are estimated construction costs in year 2000 dollars.

Table 1-1 Total project costs (millions of dollars)

	Via Owen		Via Tripoli: (includes Tripoli-Rhinelander)	
Route	**Low**	**High**	**Low**	**High**
Weston to Exeland	$58.60	$67.68	$76.83	$80.81
Exeland to Oliver	50.42	71.22	50.42	71.22
Oliver to Arrowhead, MN	35.00	35.00	35.00	35.00
Weston Substation	4.10	4.10	4.10	4.10
Tripoli Substation			4.20	4.20
Highway 8 Substation			0.20	0.20
Hodag Substation			0.10	0.10
115 kV Tripoli to Rhinelander			8.80	11.30
Total	**$148.12**	**$178.00**	**$179.63**	**$206.93**
5% impact fee for 345 kV line	5.45	6.95	6.36	7.80
Total including impact fee	**$153.55**	**$184.95**	**$185.99**	**$214.73**

The high-end cost estimate is $208 million dollars, comprised of $203 million for the 345 kV Arrowhead to Weston segment and $11 million for the 115 kV Tripoli to Rhinelander component. The initial year's ratepayer impact of a $208 million transmission line construction expenditure would be $36.2 million. This estimate is developed using a 14.4 percent economic cost of capital inclusive of taxes and a 2.5 percent depreciation rate.[4] Over the next 39 years of assumed book life for the transmission project, the annual ratepayer impact would gradually decline to zero.

Using this $36.2 million initial impact, the effect on an average ratepayer's electricity bill can be calculated. In Wisconsin, the total 1999 electric revenue requirement of Madison Gas and Electric (MGE), WP&L, WPSC, and WEPCO was $2,913 million. These are the utilities likely to receive substantial benefit from the line. In order to recover the costs of the transmission line project's construction, the total revenue requirement of $2,913 million would need to increase by $36.2 million. This would represent a 1.2 percent increase in required revenues by the four electric utilities. For a residential customer currently paying $40 a month for electricity in Wisconsin, a 1.2 percent increase in the electric bill translates into an additional 48 cents per

[4] The calculation is as follows: (.144 + .025) * $208 million = $35.2 million.

month or $5.76 per year. Through time, as the line became fully depreciated, these values would decline.

Proposed schedule

Draft EIS issued	May 2000
Public meetings	June 2000
Final EIS issued	October 2000
Public hearings	November/December 2000
Technical hearings	January 2001
PSCW Order	April/May 2001
If project is approved:	
Begin ROW acquisition	December 2001
Fabrication and shipping of steel poles	December 2001 - January 2004
Begin construction	May 2002
Substation construction	March 2002 - March 2004
Fabrication and shipping of conductor	March 2002 - January 2004
Complete construction	May 2004

Agency and Public Participation

In reviewing the Arrowhead-Weston Transmission Project, the Commission cooperates with other state, federal, and local agencies to gain information about resources in the project area and to assess the potential impact of the project on these resources. The Commission also depends on the public and citizen organizations to provide locally known information, comments on the proposed routes, and ideas for mitigating impacts. This section describes which agencies and organizations have participated in review of this project to date and their role in the process.

In addition to a CPCN from the Commission, construction of the proposed transmission line would require other permits and approvals from state or federal agencies or local governmental units. These permits and approvals are listed in Tables 1-2 and 1-3.

Federal government agencies

Table 1-2 is a list of federal government agencies and their involvement in this project.

Table 1-2 Federal government agencies involved in the project

Agency	Interest or Permit
National Park Service (NPS)	Section 7(a) determination for approval and easements to cross the St. Croix National Scenic Riverway and National Ice Age Trail.
U.S. Fish and Wildlife Service (USFWS)	Federal endangered and threatened resources.
U.S. Army Corps of Engineers (COE)	Section 404 permits to construct in wetlands. Section 10 permits to cross the St. Louis, Namekagon, Chippewa, Flambeau, and Wisconsin Rivers.
Federal Aviation Administration (FAA)	Monitor line height near airports.
The Bureau of Land Management (BLM)	Review project for potential effects on agency lands.
Natural Resource Conservation Service (NRCS)	Review project for potential impacts on the lands enrolled in the Conservation Reserve Program and the Wetland Reserve Program.
Lac Courte Oreilles Indian Tribe (U.S. Bureau of Indian Affairs)	Permits and easements to cross tribal lands (not required for all routes).

One of the federal agencies would take the lead role in meeting the federal environmental review requirements under the National Environmental Policy Act (NEPA) for the proposed project. The lead agency would solicit comments on the project from other federal agencies and prepare an environmental assessment. This process would likely not be initiated until after the final Commission decisions on the project are made. If draft permits are issued at the federal level, a public hearing on the permits would likely be held.

State government agencies

Commission staff cooperates with other state agencies in validating the information supplied by the utilities, finding answers to questions that arise during the review process, assessing impacts on natural and cultural resources, and designing mitigation measures to avoid or reduce these impacts. Table 1-3 summarizes the interests of various state agencies in the review of this project. Following the table is a description of some of the regulatory interests and responsibilities of these agencies.

Wisconsin Department of Natural Resources (DNR) staff from the central office in Madison and at regional offices within the project area have reviewed the proposed application and are working cooperatively with Commission staff to assess potential impacts on biological and natural resources along the proposed routes. Cooperative sharing of data base information and Geographic Information System (GIS) data has been instrumental in the analysis of impacts to many of those resources, both at the system level and for the proposed routes.

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), under Wis. Stat. § 32.035, is required to prepare an Agricultural Impact Statement (AIS) for any project that involves the acquisition of an interest in more than five acres of land from any single farm operation. The Arrowhead-Weston Transmission Project meets that criterion and therefore an AIS has been prepared. The executive summary of the AIS is attached to this document as Appendix A.

Table 1-3 State government agencies involved in the project

Agency	Interest or Permit
Public Service Commission of Wisconsin	Certificate of Public Convenience and Necessity .
Wisconsin Department of Natural Resources (DNR)	Permit for storm water discharge during construction. Chapter 30 permit to place structures below the high water mark, grading on the banks of and operation of machinery in navigable waters. Water quality certification as part of federal Section 404 permits. Approval and easements to cross agency-owned and managed lands. Incidental take authorization for endangered resources. Section 6F approvals to cross land subject to Federal Conservation funding requirements. Approval to withdraw county forest lands.
Wisconsin Department of Agriculture, Trade & Consumer Protection (DATCP)	Review project area to assess scope of agricultural impacts on area farms; prepare an Agricultural Impact Statement.
State Historical Society of Wisconsin (SHSW) - Division of Historic Preservation	Surveys as needed and approval of plans for the protection of cultural resources.
Wisconsin Department of Transportation (DOT)	Permits for crossing federal and state highways; approval to overlap highway ROW.
Wisconsin Department of Transportation-Bureau of Aeronautics	Review project area to assess potential impacts on airports and airstrips.
Minnesota Environmental Quality Board (MEQB)	Route designation and construction permit (Minnesota portion of the project only).

The AIS is an informational and advisory document. It describes and analyzes the potential effects of the project on farm operations and agricultural resources. Its purpose is to ensure that owners of affected farm operations in Wisconsin are informed of the potential agricultural impacts prior to the negotiation of easements. The complete AIS can be obtained by contacting Ms. Alice Halpin, AIS Program, Wisconsin Department of Agriculture, Trade and Consumer Protection, 2811 Agriculture Drive, P.O. Box 8911, Madison, WI 53708-8911 or at (608) 224-4646.

The State Historical Society of Wisconsin (SHSW) could become involved in this project at two levels. Under Wis. Stat. § 44.40, the Commission must determine if project construction and operation would affect archeological or historic architectural properties listed with the SHSW. If the Commission identifies listed sites that could be affected, it must confer with the SHSW and negotiate methods to avoid, reduce, or mitigate the adverse effects. If sites must be protected or their impacts mitigated as part of a proposed project, the Commission must enforce those methods in any certification of the project. Public input is limited in this process. However, the Commission must contact (through the applicant) native peoples who have an association with any historic property under consideration.

The National Historic Preservation Act requirements are applicable where the line would involve a federal interest such as filling or drilling in wetlands, the Lac Courte Oreilles (LCO) Reservation, or federally controlled lands. Federal requirements in Section 106 of the National Historic Preservation Act (Section 106) supersede those of Wis. Stat. § 44.40. Section 106 historic preservation requirements are more stringent and are enforced directly by the federal

agency that has a permitting responsibility or interest. For example, in the case of construction in a wetland, the United States Army Corps of Engineers (COE) would enforce Section 106 requirements as part of its wetland permit.

The SHSW, which is designated under Section 106 as the State Historic Protection Officer, can require a field survey of each federal area of potential effect to determine if any archeological or architectural artifacts or traditional cultural areas are present. If something is found, the SHSW may require a more detailed survey to determine the significance of the find and its eligibility for entry into the National Register of Historic Places. After the significance of a historic property is determined, the federal agency and the applicant must negotiate with the SHSW to minimize or mitigate the adverse effects of the project on that property. Other persons or entities with an interest in the historic property must be identified so they may join the Section 106 process as consulting parties.

Resolution of all Section 106 requirements might not be completed at the time of the hearing on this project because of the federal agencies' timetables. However, in this docket, it is expected that they will involve relatively small portions of the overall project.

Potential for discovering sites during construction

Much of northern Wisconsin has not been surveyed for archeological or historic resources. In this region, there is still a strong potential for archeological materials to be uncovered in certain geographic situations, such as near streams, wetlands, lakes, or hills. Sometimes, the construction crew will encounter archeological artifacts or human remains. If such finds were made, they would need to be reported to the SHSW at once. If human remains were discovered at any time during the project construction, construction would need to stop, and WPSC or MP would need to contact the SHSW immediately for compliance with Wis. Stat. § 157.70, which provides for the protection of burial sites.

WPSC or MP would employ a project inspector or group of inspectors to ensure that environmental requirements are met and vulnerable features are not unnecessarily adversely affected. It would be of value if the inspector(s) were trained to identify archeological resources, especially human remains, during construction. Because of the length of this project, more than one inspector could be needed to allow construction to occur simultaneously in different parts of the project across the state.

County and local government agencies

County and local governments have a strong interest in selecting a system alternative or an electric transmission line route that minimizes impacts on their community and the resources that they are charged to manage and protect. These offices and institutions attempt to ensure that the routes and design of a proposed transmission line meet agency standards and permitting requirements and that the project conforms to local ordinances and zoning regulations. Local governments often provide information regarding land use plans, county forest plans (including special use areas), watershed management plans, and agricultural extension programs to utilities and Commission staff.

Although the applicants generally do not seek any local permits until after the final Commission decision on the project, the Commission needs to be aware of potential conflicts with local ordinances, zoning, or land use plans when making its decision. In many cases, local governments continue working with the applicants after the Commission approves a project to resolve concerns through changes in line design or adjustments in pole placement. State statutes restrict the ability of local governments to block a project through a local ordinance if the project has received a CPCN.

To date, local government offices in the project area and surrounding counties have been very active in reviewing the transmission line proposal and providing comments and information to Commission staff. Many counties and towns have submitted resolutions to the Commission opposing the project, while others have passed resolutions in support of it.

Environmental impact assessment fees

1999 Wisconsin Act 9, passed in late 1999, established a requirement for the Wisconsin Department of Administration (DOA) to promulgate administrative rules that would require a person who is issued a CPCN, for a high voltage transmission line of 345 kV or greater to pay the following fees to DOA:

> A one-time environmental impact fee in the amount equal to 5 percent of the cost of the transmission line. DOA would distribute 50 percent of this one-time fee to each county impacted by the high-voltage transmission line in proportion to the amount of investment in the high-voltage transmission line allocated to each such county. The other 50 percent of this one-time fee would be distributed to each town, village, and city impacted by the high-voltage transmission line, in proportion to the amount of investment allocated to each such town, village, and city. The money received by local jurisdictions, from this one-time assessment, may be used only for park, conservancy, wetland, or other similar environmental programs.
>
> An annual impact fee in an amount equal to 0.3 percent of the cost of the transmission line. DOA would distribute the annual impact fee to each town, village, and city that is impacted by the high-voltage transmission line, in proportion to the amount of investment allocated to each such town, village and city.

DOA has not yet promulgated the administrative rules that would implement the fees established in 1999 Wisconsin Act 9. As a result, details about the implementation of the above-mentioned fees, and the potential local impact of the fees, are unknown.

Publicly financed intervenors

Under Wis. Stat. § 196.31 and Wis. Admin. Code ch. PSC 3, the Commission may compensate any organization or individual for the cost of participating in its proceedings if the following conditions are met: (1) the applicant is a customer of the utility that is the subject of the proceeding or someone who may be materially affected by the outcome of the proceeding;

(2) the position must be represented for a fair determination in the proceeding; (3) full intervention without compensation would result in a "significant financial hardship;"and (4) the applicant has been granted full-party status and will participate as such in the proceeding.

The Commission received requests for intervenor compensation for this project from the Citizens' Utility Board (CUB), the North American Water Office (NAWO), Save Our Unique Lands (SOUL), the Wisconsin Alliance of Cities (WAC), and Wisconsin's Environmental Decade (WED). The Commission approved intervenor compensation awards as follows: CUB has been awarded $100,000; SOUL has been awarded $150,000; and WED has been awarded $50,000.

General public involvement

Public involvement and comments throughout the review process also contribute to the Commission's analysis of a proposed project. Public input is solicited through:

- Written and spoken comments from public information meetings sponsored by the applicants or the Commission.
- Phone calls and written comments received prior to completion of the draft EIS.
- Written and oral comments on the draft and final EIS.
- Testimony at public hearings.

The applicants, WPSC and MP, sponsored a series of public information meetings throughout the project area in July 1999. Several additional meetings were held in October 1999. The Commission requested comments from the public on the project at these meetings and via a mail-in comment form. The Commission also solicited comments when it sent a notification of the proposed project to all interested and affected persons, towns, counties, and municipalities after receiving the application in November 1999. Comments received through the end of April 15, 2000, were used in the development of the draft EIS.

Following the release of the draft EIS, a 45-day comment period was open to comment on the draft EIS. The comment period closed on July 5, 2000. The Commission hosted public meetings to gather comments on the draft EIS in Abbotsford on June 6, Solon Springs on June 13, Ladysmith on June 14, and Tomahawk on June 15 of this year.

Commission staff prepared the final EIS, considering comments received on the draft version. A period of at least 30 days will occur between the issuance of the final EIS and the opening of the public hearing for this case. This period allows the public and government agencies an opportunity to review the final EIS prior to the hearings.

Testimony received during the public hearings will become part of the case record. The Commission is required to base its final decision to approve, reject, or modify the applicants' proposal on the case record. At the hearings, a court reporter will record the testimony presented by Commission staff, utility staff, other agencies, organizations, and the public. Written comments received by the Commission prior to the hearing do not automatically

become part of the case record. The final EIS will be entered into the record as a portion of Commission staff's testimony.

The Role of the Commission

Approval, denial, or modification of the proposed project

The Commission has the authority to approve, deny, or modify the application of WPSC and MP to build the 345 kV Arrowhead-Weston Transmission Project, the 115 kV Tripoli-Rhinelander transmission line, and the new 345/115 kV Tripoli Substation. The decisions regarding the 345 kV line, the 115 kV line, and the Tripoli Substation are interrelated:

- If the proposal to construct the 345 kV Arrowhead-Weston line is denied, construction of the new substation and the 115 kV line would also be denied.
- If the 345 kV line is approved and a route from the Tripoli Sector is selected, the Commission must decide whether to approve the construction of the new substation and the 42-mile 115 kV transmission line to Rhinelander.
- If the 345 kV line is approved but a route from the Owen Sector is selected, instead of a route from the Tripoli Sector, the proposal to build the new substation and the 115 kV line would be denied. It would be necessary for WPSC to consider meeting local load-serving needs in the Rhinelander area through another means.

Considerations for the Commission Decision

Wis. Stat. § 196.491(3) requires the Commission to make all of the following determinations before approving construction of the Arrowhead-Weston Transmission Project:

- Under Wis. Stat. § 196.491(3)(d)2., the proposed facilities must satisfy the reasonable needs of the public for an adequate supply of electric energy.
- Under Wis. Stat. § 196.491(3)(d)3., the facilities must be in the public interest, considering:
    - Alternative sources of supply.
    - Alternative locations or routes.
    - Individual hardships.
    - Engineering factors.
    - Economic factors.
    - Safety.
    - Reliability.
    - Environmental factors.

- Under Wis. Stat. § 196.491(3)(d)3r., the 345 kV line must use existing ROWs to the extent practicable and the routing and design of the line must minimize environmental impacts in a manner that is consistent with achieving reasonable electric rates.
- Under Wis. Stat. § 196.491(3)(d)3., the 345 kV line must provide usage, service, or increased regional reliability benefits to the wholesale and retail customers or members in this state and the benefits of the line must be reasonable in relation to the cost of the line.
- Under Wis. Stat. § 196.491(3)(d)4., the facilities must not have undue adverse impact on environmental values such as, but not limited to:
    - Ecological balance.
    - Public health and welfare.
    - Historic sites.
    - Geological formations.
    - Aesthetics of land and water.
    - Recreational use.
- Under Wis. Stat. §§ 196.49(3)(b) and (d)5., the facilities must not substantially impair the efficiency of the applicants' service or unreasonably exceed the applicants' probable future requirements, and the value or available quantity of service the facilities provide must be proportionate to their cost.
- Under Wis. Stat. § 196.491(3)(d)6., the facilities must not unreasonably interfere with the orderly land use and development plans for the area involved.
- Under Wis. Stat. § 196.491(3)(d)7., the facilities must not have a material adverse impact on competition in the relevant wholesale electric service market.

Wis. Stat. §§ 1.12 and 196.025 require the Commission to give priority to specific methods of meeting energy demands, to the extent these methods are "cost-effective and technically feasible." The Commission must consider options based on the following priorities, in the order listed, for all energy-related decisions:

- Energy conservation and efficiency.
- Noncombustible renewable energy resources.
- Combustible renewable energy resources.
- Nonrenewable combustible energy resources, in the order listed:
    - Natural gas.
    - Oil or coal with a sulfur content of less than 1 percent.
    - All other carbon-based fuels.

If the Commission finds that any of these statutorily preferred options, or a combination of these options, is a cost-effective and technically feasible alternative to either the 345 kV transmission line or to the 115 kV transmission line and its substation, the Commission must reject the project as proposed.